



CMD273P3

DC-12 GHz DPDT Transfer Switch

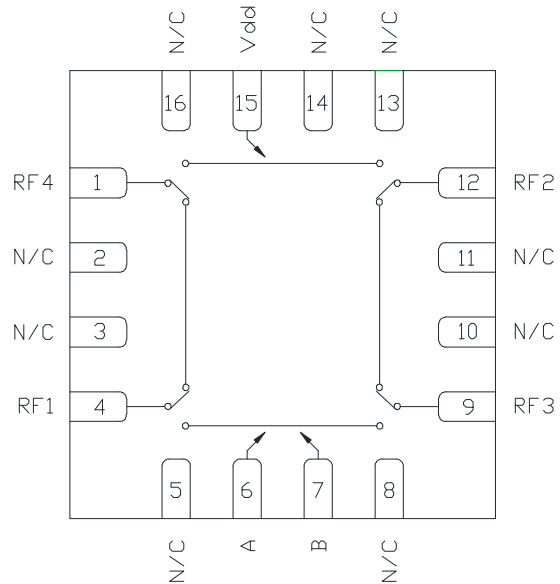
Features

- ▶ Low loss broadband performance
- ▶ High isolation
- ▶ Non-reflective design
- ▶ Pb-free RoHs compliant 3x3 SMT package

Description

The CMD273P3 is a low loss broadband positive control MMIC DPDT transfer switch housed in a leadless 3x3 mm surface mount package. The CMD273P3 covers DC to 12 GHz and offers a low insertion loss of 1.7 dB and high isolation of 42 dB at 6 GHz. The CMD273P3 operates using complementary control voltage logic lines of 0/+5 V.

Functional Block Diagram



Electrical Performance - $V_{ctl} = 0/+5\text{ V}$, $V_{dd} = +5\text{ V}$, $T_A = 25\text{ }^{\circ}\text{C}$, $F = 6\text{ GHz}$

Parameter	Min	Typ	Max	Units
Frequency Range	DC - 12			GHz
Insertion Loss		1.7		dB
Isolation		42		dB
Return Loss		13		dB
Input P0.1dB		25		dBm
Input IP3		44		dBm
Switching Speed		12		ns

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Specifications

Absolute Maximum Ratings

Parameter	Rating
RF Input Power	+27 dBm
Bias Voltage (Vdd)	+7.0V
Control Voltage Range (A,B)	-0.5V to Vdd + 1V
Channel Temperature, T _{ch}	150 °C
Thermal Resistance, Θ_{jc}	46.6 °C/W
Operating Temperature	-40 to 85 °C
Storage Temperature	-55 to 150 °C

Exceeding any one or combination of the maximum ratings may cause permanent damage to the device.

Bias Voltage & Current

Vdd Range = +5.0V $\pm$ 10%		
Vdd (V)	Idd (Typ) (uA)	Idd (Max) (uA)
+5	5	10

TTL/CMOS Control Voltages

State	Bias Condition
Low	0V to +0.2V @ 1 uA Typ
High	Vdd $\pm$ 0.2V @ 1 uA Typ

Truth Table

Control Input					
A	B	RF4 to RF2	RF1 to RF3	RF4 to RF1	RF2 to RF3
Low	High	On	On	Off	Off
High	Low	Off	Off	On	On

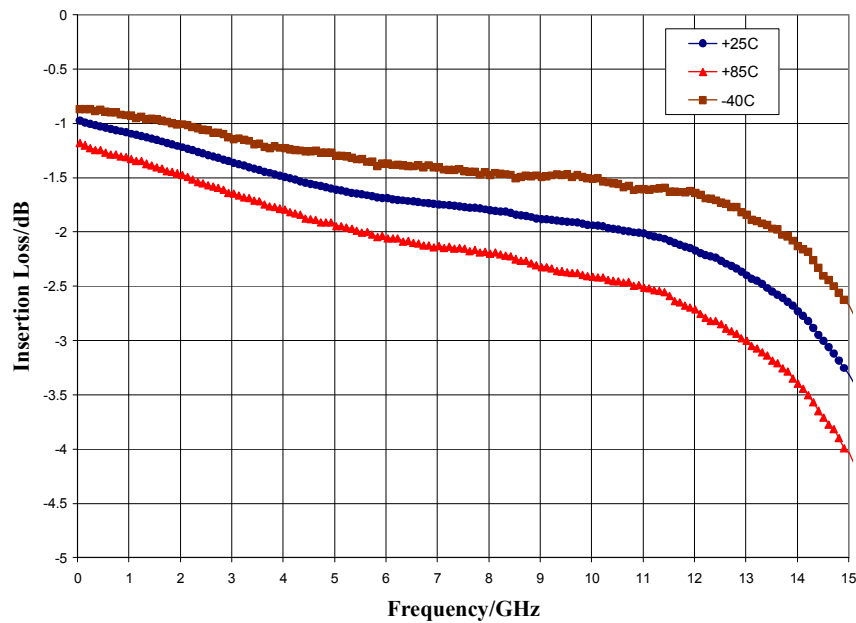
Electrical Specifications - V_{ctl} = 0/+5 V, Vdd = +5 V T_A = 25 °C

Parameter	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range	DC - 4			DC - 8			DC - 12			GHz
Insertion Loss		1.2	1.8		1.7	2.1		1.9	2.5	dB
Isolation	36	42		36	42		25	35		dB
Return Loss		15			13			13		dB
Input P0.1dB		25			25			24		dBm
Input IP3		46			44			40		dBm
Switching Speed		12			12			12		ns

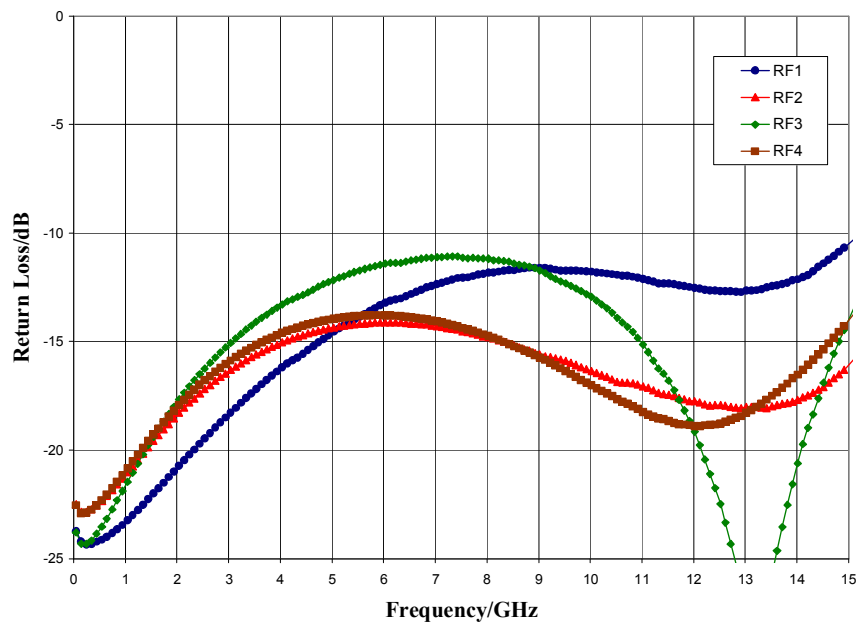
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Typical Performance

Insertion Loss vs. Temperature



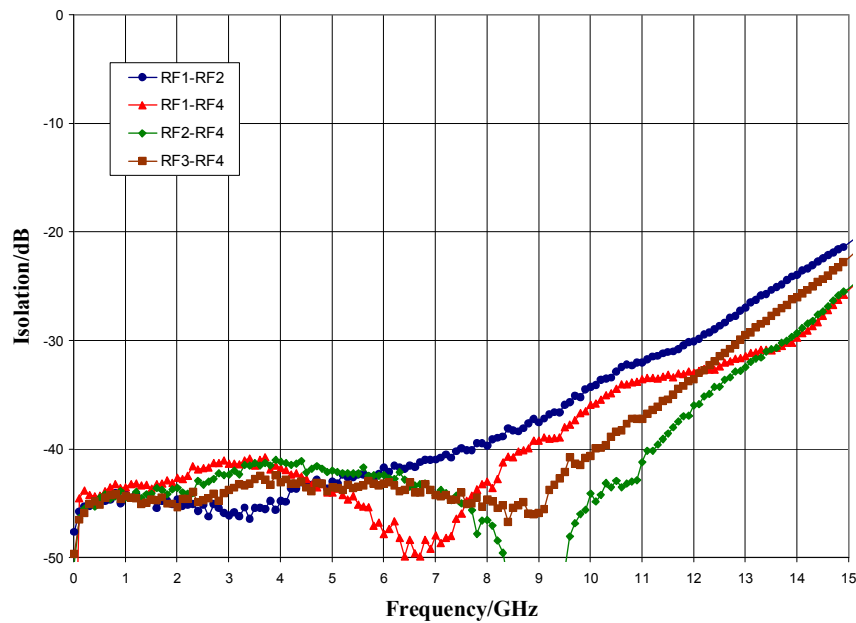
Return Loss



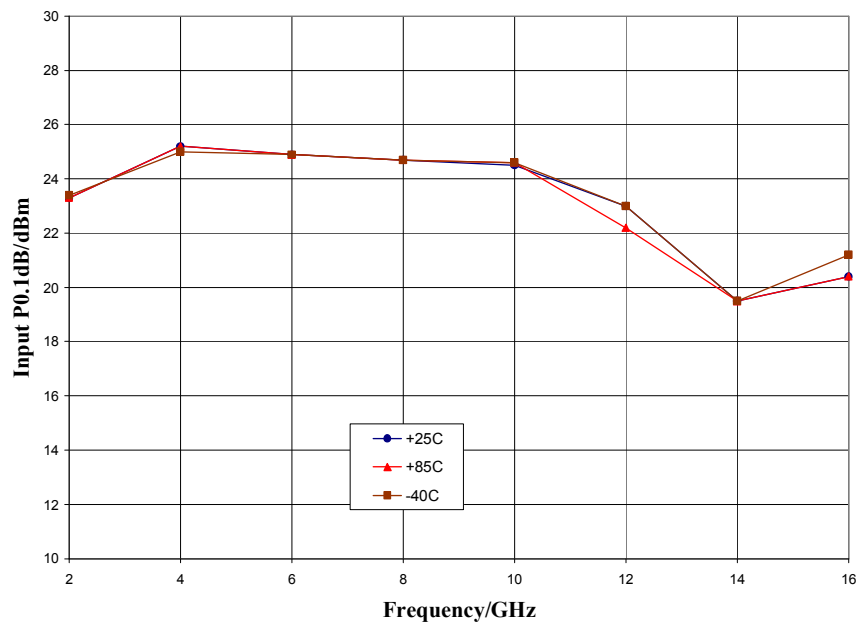
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Typical Performance

Isolation



Input P0.1dB Compression Point vs. Temperature



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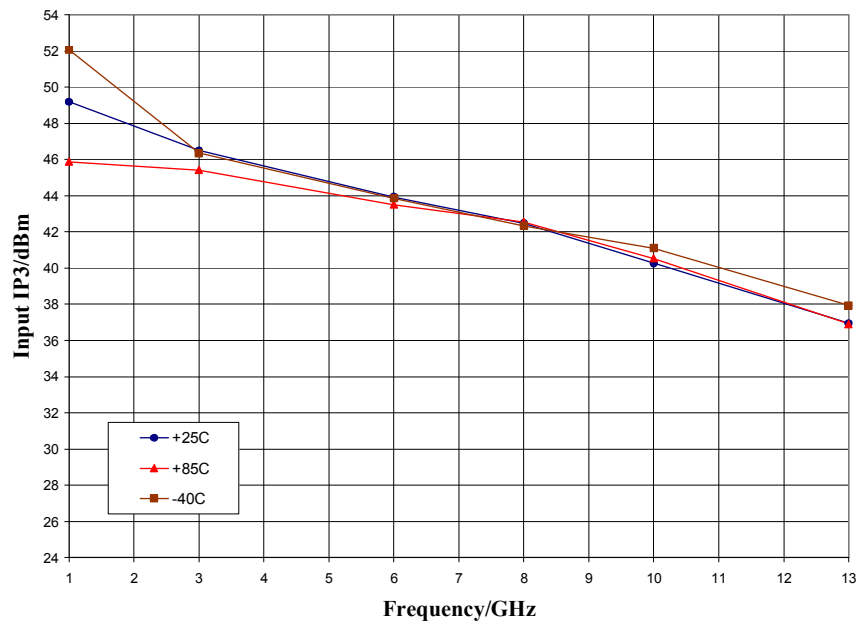


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Typical Performance

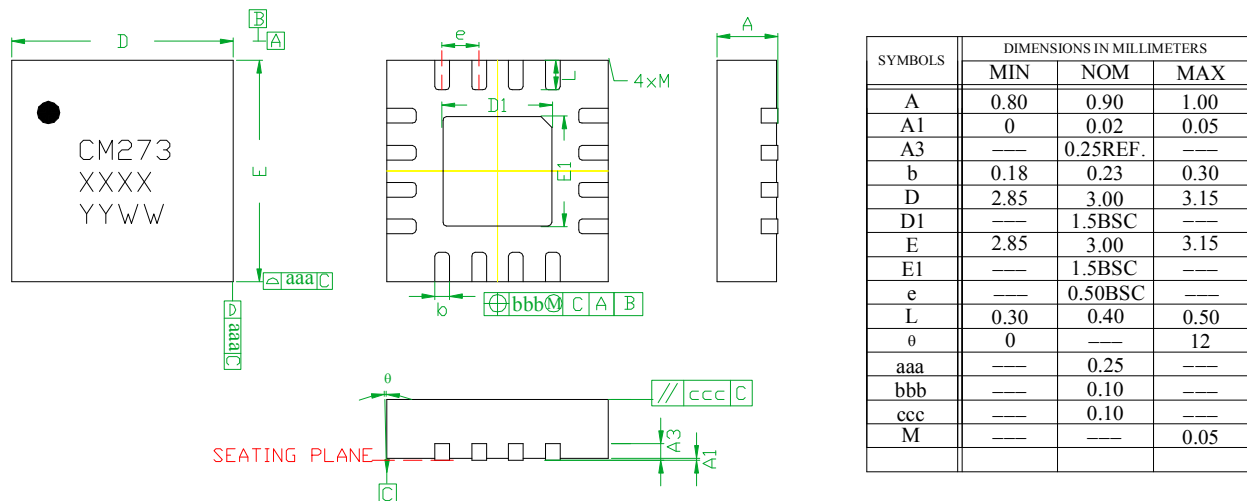
Input Third Order Intercept Point vs. Temperature



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Mechanical Information

Package Information and Dimensions



NOTES:

1. DIMENSIONS ARE IN MILLIMETERS
2. RoHS COMPLIANT MOLD COMPOUND
3. LEADFRAME MATERIAL: COPPER ALLOY
4. LEAD FINISH: 100% MATTE Sn
5. INDICATED DIMENSION/TOLERANCE APPLIES TO LEADS AND EXPOSED PAD

Recommended PCB Land Pattern

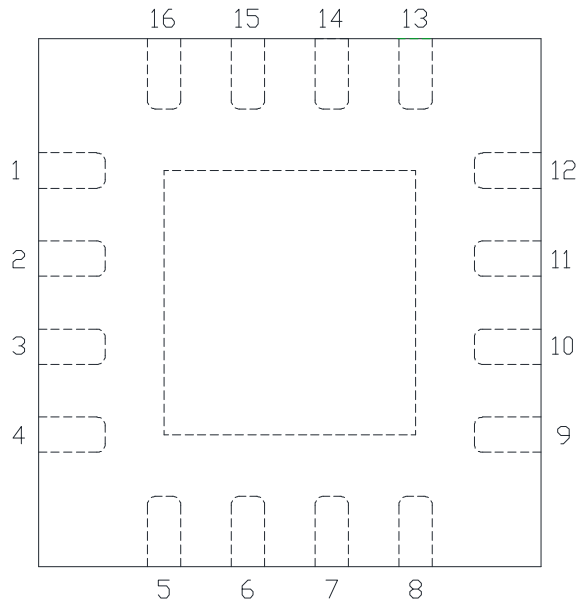
Custom MMIC recommends that the user develop the land pattern that will provide the best design for proper solder reflow and device attach for their specific application. Please review Custom MMIC Application Note AN 105 for a recommended land pattern approach.

Recommended Solder Reflow Profile

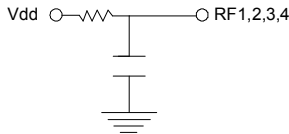
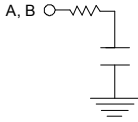
Custom MMIC recommends screen printing with belt furnace reflow to ensure proper solder reflow and device attach. Please review Custom MMIC Application Note AN 102 for a recommended solder reflow profile.

Pin Description

Pin Diagram



Functional Description

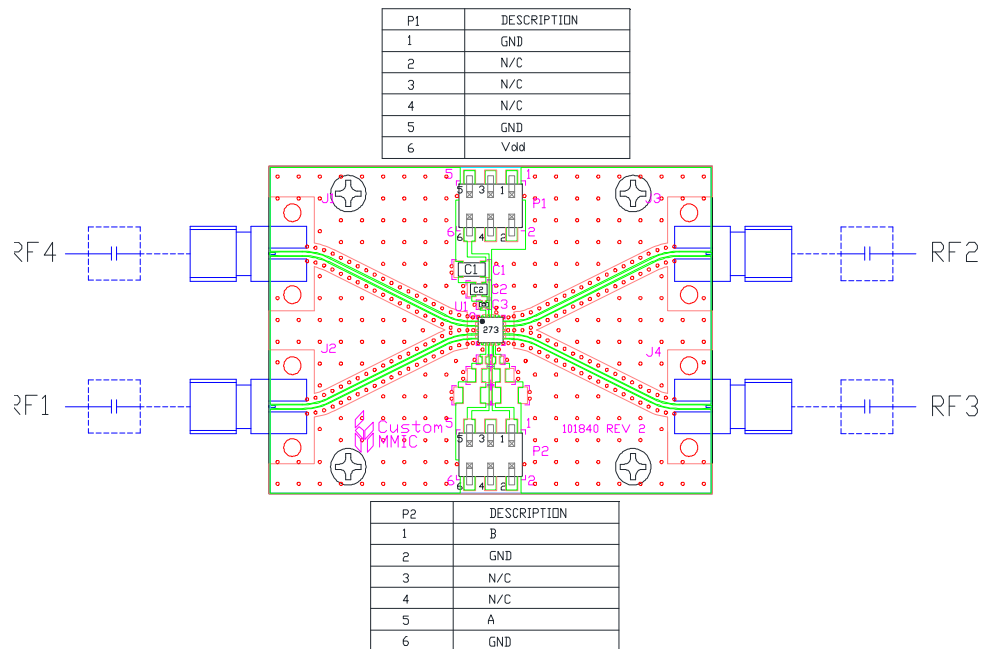
Pin	Function	Description	Schematic
1,4, 9,12	RF4, RF1, RF3, RF2,	These pins are DC coupled and matched to 50 Ohm. Blocking capacitors are required	
15	Vdd	Power supply voltage	
6	CTLA	See truth table and control voltage table	
7	CTLB	See truth table and control voltage table	
2,3,5,8,10,11, 13,14,16	N/C	No connection required. These pins may be connected to RF/DC ground	
Die paddle	Ground	Connect to RF / DC ground	

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Applications Information

Evaluation Board

The circuit board shown has been developed for optimized assembly at Custom MMIC. A sufficient number of via holes should be used to connect the top and bottom ground planes. As surface mount processes vary, careful process development is recommended.



Bill of Material

Designator	Value	Description
J1 - J4		SMA End Launch Connector
P1, P2		6 Pin Header
C1	0.33 μ F	Capacitor, Tantalum
C2	1000 pF	Capacitor, 0603
C3	100 pF	Capacitor, 0402
U1		CMD273P3 DPDT Transfer Switch
PCB		101840 Evaluation PCB

GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.

Please note, all information contained in this data sheet is subject to change without notice.

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